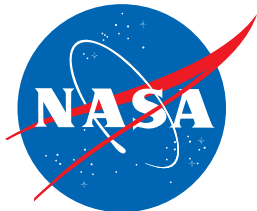

Overview of Space Science Opportunities

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Greenbelt, MD

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MU-SPIN 9th Annual Users' Conference
September 22, 1999



Outline

- **Space Science Overview**
 - NASA Centers and Space Science Missions
- **Announcements of Opportunity (AO)**
- **NASA Research Opportunities (NRA)**
- **Resident Research Associateships (RRA)**
- **Graduate Student Research Program (GSRP)**
- **Summer Faculty Fellowships (SFF)**
- **Other Opportunities**
- **Summary**

Space Science Overview

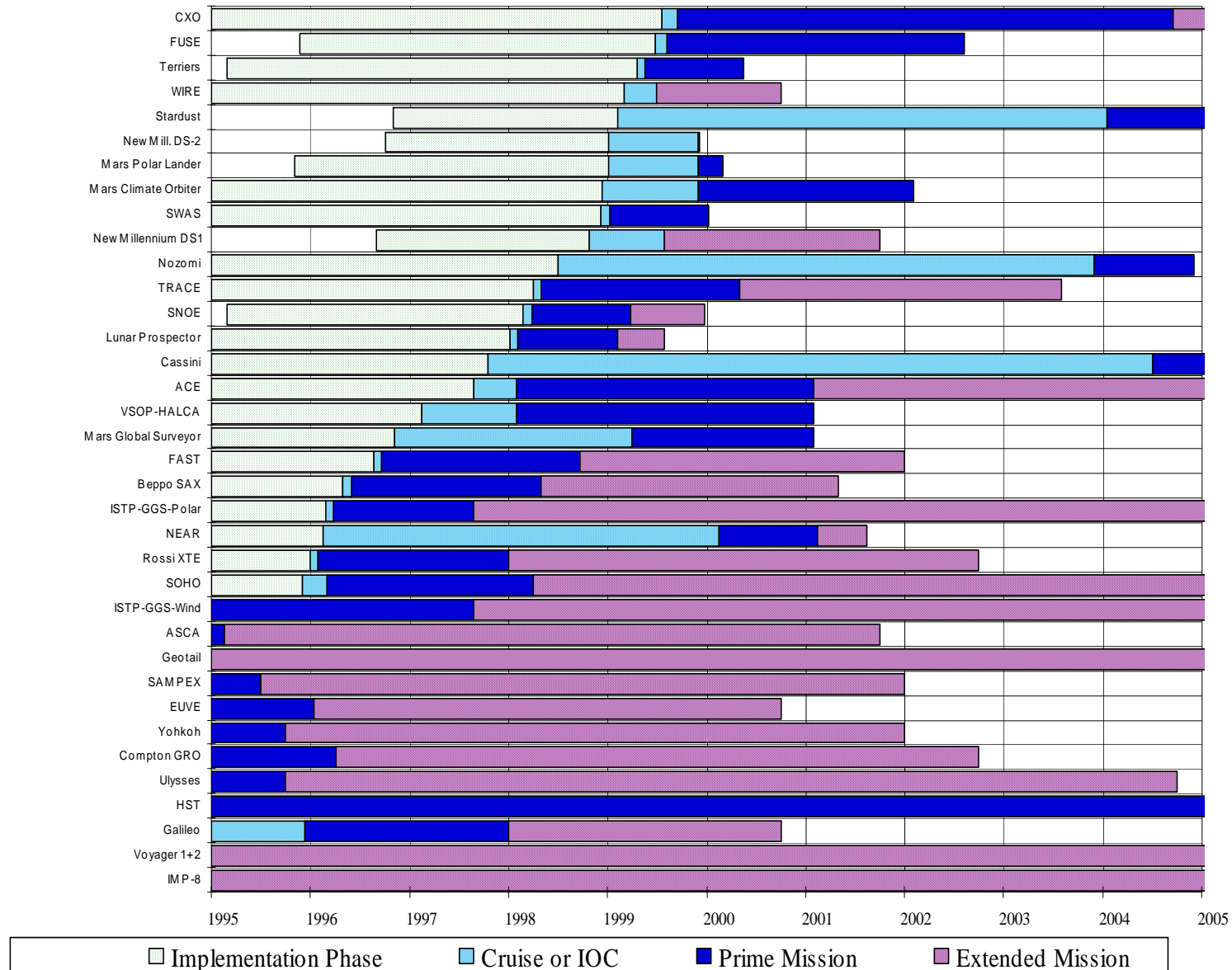
- **Space Science**

- Astrophysics Research
 - ❖ High Energy, Ultraviolet/Optical, Infra-red/Radio
- Space Physics Research
 - ❖ Sun, Heliosphere, Cosmic Rays
 - ❖ Earth and Planets: Magnetosphere, Ionosphere
- Planetary Physics
 - ❖ Atmospheres, solid planets, asteroids, minor bodies, and comets










- **NASA Centers involved in Space Science Research**

- Goddard Space Flight Center (<http://gsfc.nasa.gov/>)
 - ❖ Greenbelt, Maryland
- Jet Propulsion Laboratory (<http://www.jpl.nasa.gov/>)
 - ❖ Pasadena, California
- Marshall Space Flight Center (<http://msfc.nasa.gov/>)
 - ❖ Huntsville, Alabama
- Ames Research Center (<http://www.arc.nasa.gov/>)
 - ❖ Moffett Field, California

Space Science Operating Missions



8/25/99

  ISSUE/DUE DATES
   DRAFT/RELEASE
   STEP 1 -- STEP 2 PROPOSALS DUE
  TENTATIVE SELECTION DATE
   TENTATIVE DATES

ISSUE/DUE DATES

DRAFT/RELEASE

STEP 1 - - STEP 2
PROPOSALS DUE

TENTATIVE
SELECTION DATETENTATIVE
DATES

NASA Research Announcements (NRAs)

- **Issued from NASA Headquarters on a regularly scheduled basis**
- **Letters of Intent, Proposal, Peer Review, Award**
 - Space Science Research & Supporting Information Technologies
 - Proposals range in funding \$10K-300K, \$1-5M available, highly competitive
 - Proposals range from 15-30 pages
- **Researchers can subscribe to e-mail notification of all OSS research announcements (NRA's, AO's)**
- **All OSS research announcements (whether you subscribe or not) will continue to be available on the web**
- **<http://spacescience.nasa.gov/research.htm>**

8/23/99

[illegible]

A diagram of a simple graph consisting of two vertices, represented by yellow diamonds, connected by a single horizontal edge.

TENTATIVE DATES

Research Opportunities in Space Science (ROSS)

OFFICE OF SPACE SCIENCE NASA RESEARCH ANNOUNCEMENTS (NRA'S)

8/23/99

TYPE	TITLE	1999												2000				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
NRA 99-OSS-01	RESEARCH OPPORTUNITIES IN SPACE SCIENCE (Omnibus NRA)	✓																
	SO HEMISPHERE CORONAGRAPH FOR PLANET DETECTION				◆	▲			●									
	PLANETARY ASTRONOMY				◆		▲			●								
	HIGH ENERGY ASTROPHYSICS				◆		▲		●									
	EXO BIOLOGY				◆			▲				●						
	COMPARATIVE PLANETARY ATMOSPHERES				◆		▲			●								
	JOVIAN SYSTEM DATA ANALYSIS				◆		▲			●								
	ASTROPHYSICS DATA PRORAM				◆		▲			●								
	LONG-TERM SPACE ASTROPHYSICS				◆		▲			●								
	COSMOCHEMISTRY				◆			▲				●						
	PLANETARY GEOLOGY AND GEOPHYSICS				◆		▲			●								
	ORIGINS OF SOLAR SYSTEMS				◆			▲		●								
	ASTROPHYSICS R&A				◆		▲			●								
	ASTROPHYSICS SUBORBITAL				◆			▲				●						
	ENERGETICS AND DYNAMICS OF THE MESOSPHERE AND LOWER THERMOSPHERE: TIMED/CEDAR COLLABORATIVE STUDIES					◆			▲				●					
	PLANETARY SUBORBITAL RESEARCH					◆			▲				●					
	MAGNETOSPHERIC PHYSICS						◆			▲				●				
	SR&T						◆			▲				●				
	MITM SUBORBITAL PROGRAM						◆			▲				●				
	ASTROPHYSICS THEORY PROGRAM						◆			▲				●				
	APPLIED INFORMATION SYSTEMS RESEARCH						◆			▲				●				
	PLANETARY INSTRUMENT DEFINITION AND DEVELOPMENT							◆		▲				●				
	SOLAR PHYSICS R&A AND SUBORBITAL								◆		▲			●				
	MARS DATA ANALYSIS								◆			▲			●			
	SEC GI PROGRAM									◆			▲			●		
	LUNAR DATA ANALYSIS												◆		▲			●



RELEASE DATE



PROPOSAL DUE DATE



PEER REVIEW



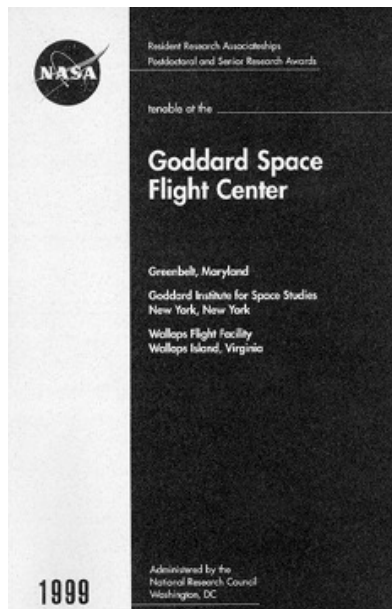
AWARD DATE

Applied Information System Research Program (AISRP)

- AISR conducts information systems research to apply new developments in computer science & information technology to improve and enhance ongoing support for OSS science programs.
- The specific goals of the AISR program are to:
 - Develop advanced tools and capabilities for the acquisition and utilization of science data and information
 - Exploit advances in computer science and information technology for the benefit of space science
 - Promote strong collaborations involving the space science community, computer science community, data system engineers and technologists, academia, and the private sector and technology innovators.
- The period of performance for solicited proposals may be from one to three years (this years deadline has passed)
- Background information and abstracts for current investigations being conducted:
<http://www.hq.nasa.gov/office/oss/computer/aisr/aisr.html>

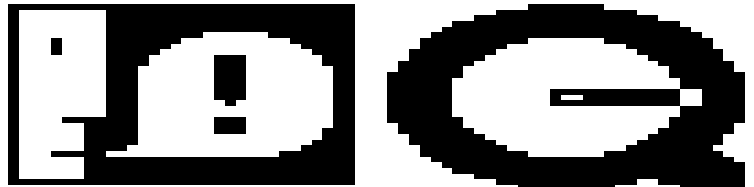
Resident Research Associateships (RRA)

- **For Postdoctoral and Senior scientists this program provides up to 2 years full support at a NASA Center**
- **Independent research in a collaborative environment using NASA facilities**
- **Typically leads to other important NASA opportunities**

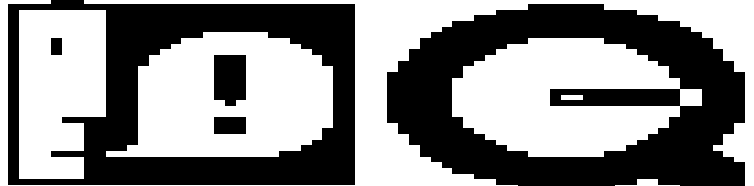


- Each center produces a booklet of opportunities
- Find the opportunity most closely related to your work
- Contract the Research Advisor and discuss your science goals relative to the research opportunity
- Fill out application and 2-3 page research proposal
 - Deadline three times per year: January 15, April 15, August 15
- Proposal is peer reviewed and selections announced
- Work at the NASA center with your Research Advisor
- '99: 350 New awards expected with ~ 1,300 applications
- Postdoc scientists \$42K; Senior scientists higher award
- <http://university.gsfc.nasa.gov/RRA/RRA.html>

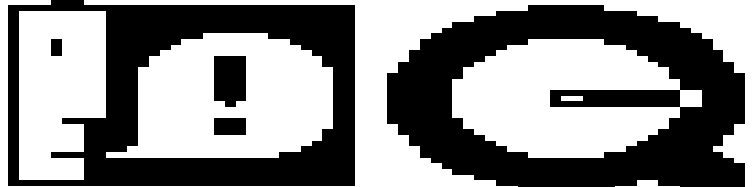
New RRA Post Doc, Dr. Beth A. Brown



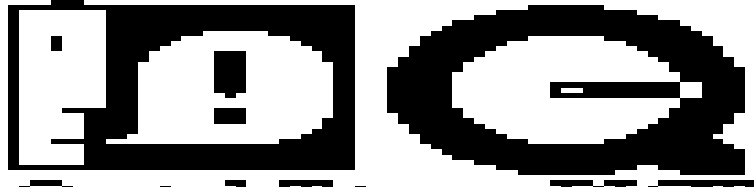
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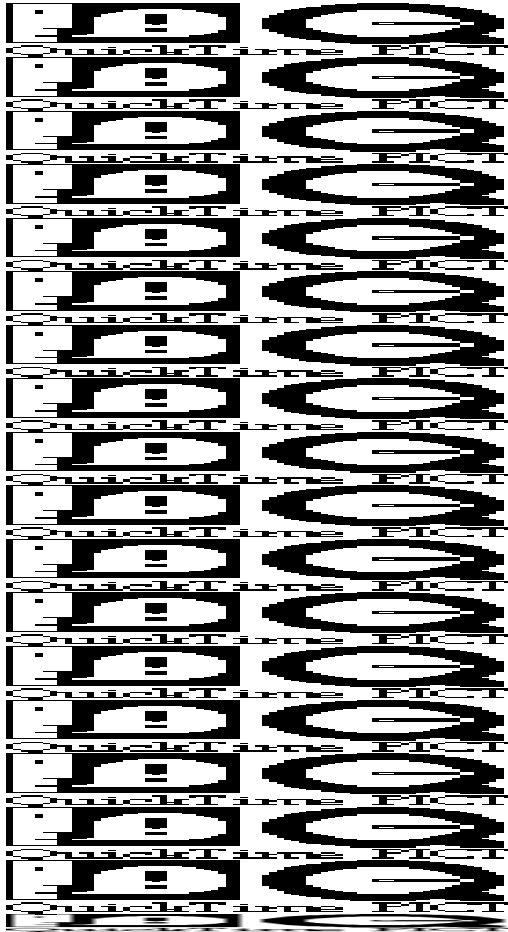
- **Thesis: "X-ray Emission in Early-Type Galaxies Surveyed by ROSAT"**

- Complete magnitude-limited sample of elliptical galaxies
- Dr. Joel N. Bregman, Advisor at University of Michigan

- **At GSFC, will use archival data with new observations to:**

- Extend the magnitude limit of the thesis sample and determine environmental effects on the observed X-ray luminosities
- Measure abundances to confirm published ROSAT and ASCA results
- Collaborate on high energy astrophysics research with members of the Astro-E XRS instrument team
- Apply research results to produce educational materials on the Web

New RRA Post Doc, Dr. Anton Koekemoer



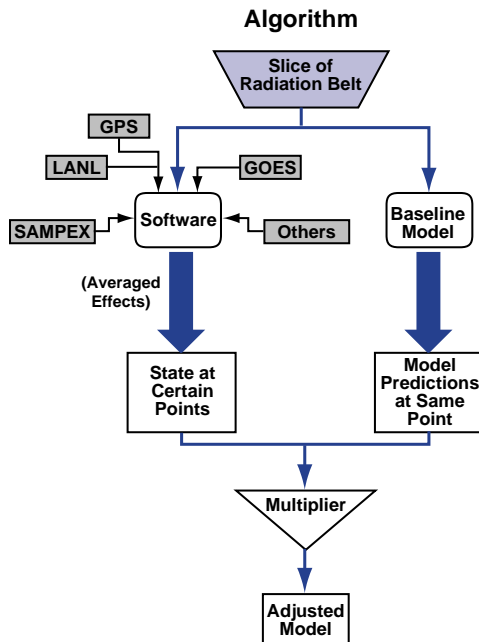
- **Thesis: "Dynamics and Excitation of Extended Emission-Line Regions in Radio Galaxies"**
 - Mount Stromlo and Siding Spring Observatories, Australian National University
 - Advisors: Dr. G. V. Bicknell, Dr. M. A. Dopita, Prof. R. D. Ekers
 - An investigation of interactions between radio galaxies and their environment
- **RRA Project at GSFC:**
 - A detailed investigation of the expansion of radio galaxy lobes (a three-dimensional hydrodynamic simulations using the GSFC/Cray T3E)
 - Study the effects of mergers between clusters of galaxies by using radio galaxies in the clusters to trace the dynamics of the hot intracluster gas
 - Obtain observational constraints on clusters and radio galaxies using the unique GSFC archives and X-ray mission data



Graduate Student Research Program (GSRP)

- **Science & engineering graduate students enrolled full time in an accredited U.S. college or university are eligible for the GSRP**
- **Provides qualified graduate students, in residence at their home institutions, with fellowship support**
 - Research projects of mutual interest to the student and NASA mentor
 - Research areas include: aeronautics, Earth sciences, space sciences, life sciences, astrophysics, high-performance computational analysis, ...
- **1-year grants, renewable for up to 3 years at \$22K/yr**
 - Travel to NASA Center supported for discussions/work with NASA advisor
- **Applications, research proposal and supporting materials must be postmarked by February 1st**
- **Peer reviewed and selected**
 - At GSFC 6-12 new selections per year with ~ 60 applicants
- **<http://university.gsfc.nasa.gov/GSRP/GSRP.html>**

GSRP , Mr. Dan Moorer

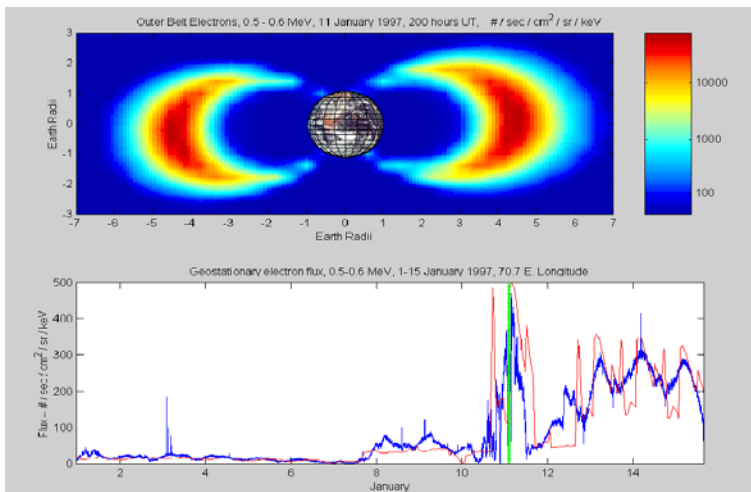


- **Ph D Thesis Project: “Outer Electron Belt Modeling by Data Assimilation of Satellite Flux Data”**

- To develop a system that assimilates and inter-calibrates real-time outer electron belt flux data and provides a specification of particle fluxes for operational use.
- Dr. D. N. Baker, Advisor at the University of Colorado

- **Relevance to Work at GSFC:**

- Will contribute to the development of a new generation of NASA trapped radiation models
- Drs. S. F. Fung & J. L. Green, mentors at SSDOO GSFC



Summer Faculty Fellowships

- **U.S. college and university faculty members with a minimum 2 year's experience are eligible**
- **Research Fellowships are awarded to qualified engineering and science faculty members for summer research at a NASA Center**
 - Fellows are encouraged to continue their research when they return to their universities, to include space research concepts in their courses and also to encourage their students to become involved in space research.
- **Duration: 10-week summer program from May - August**
- **Fellows may be invited to reapply for a second summer**
- **Applications and supporting documents due January 14**
- **Award: \$1000/week (plus \$1000 relocation allowance, where applicable).**
- **Internet Address: <http://SFFP.gsfc.nasa.gov>**

Other Opportunities

- **NASA Centers seeking civil servants: World Class Information Science Computing Opportunities**
- **GSFC is seeking computer scientists, computational scientists, systems engineers and computer engineers with extraordinary leadership potential in information science and its application to Earth and Space Science.**
- **Approximately one dozen permanent positions and/or term appointments shall be offered to qualified candidates with established exemplary experience and/or strong academic records.**
- **Term appointments have a maximum duration of four years with full civil service benefits, which could lead to a permanent civil service position.**
- **<http://itjobs.gsfc.nasa.gov/ad-text.html>**

Summary

- **NASA maintains a large number of exceptional programs for students and faculty to participate in the space program. I presented only a few of them!**
 - For more information <http://university.gsfc.nasa.gov/university.html>
- **Based on your research interests begin making contacts with NASA researchers**
 - Visit NASA center web pages for contacts (ie: <http://ssdoo/staff/bios/>)
- **Faculty:**
 - Summer Faculty Fellowships
 - RRA Senior Research
- **Students**
 - Graduate Student Research Program
 - RRA Postdoctoral
- **Experience gained will significantly help you successfully propose for NRA and AO**